MEMORANDUM

TO: Members, Clark Fork Basin Water Management Task Force
FROM: Matt McKinney and Gerald Mueller, Project Coordinators
SUBJECT: Summary of the January 5, 2004 Meeting
DATE: January 22, 2004

Participants

The following people participated in the Task Force meeting:

Task Force Members:

Eugene Manley	Granite County
Flathead Irrigation District	
Fred Lurie	Blackfoot Challenge
Jim Dinsmore	Upper Clark Fork River Basin Steering Committee
Elan Darrow	Flathead Basin Commission
Steve Fry	Avista Corp
Holly Franz	PPL Montana
Marc M. Spratt	Flathead Conservation District
Verdell Jackson	Legislature

Staff:

Matt McKinney	Montana Consensus Council (MCC)
Gerald Mueller	MCC
Mike McLane	Montana Department of Natural Resources and Conservation (DNRC)

Meeting Goals:

$ Review Chapters 7 & 9 of the water management plan
$ Discuss hydropower water rights, junior rights and future water development
$ Learn about BPA funded subbasin planning
$ Consider recommendation regarding the irrigated acreage methodology
$ Consider a letter of support for federal funding for an aerial data collection in the Flathead
$ Discuss work plan

Chapters 7 & 9 of the Water Management Plan

Gerald Mueller lead a discussion of the latest drafts of Chapters 7 & 9 of the water management plan. The Task Force revised both chapters, and the revisions are included below in Appendices 1 and 2.

Discussion of Ideas Related to Chapter 8, Strategies to Promote the Orderly Development of Water

Mike McLane presented two ideas related to promoting the orderly development of water. One idea was addressed in the paper passed out to the Task Force entitled, "Assuring Water for Future Development: a Need for New Criteria?" The paper is included in Appendix 3 below. Discussion of this paper was postponed until the February meeting. The second idea addressed the means by which the state could allocate unallocated water, i.e. water for which no water right currently exists. Presently, the state makes additional water allocations by issuing new water right permits. These permits grant a permanent right to use water unless the conditions of its use change. Mr. McLane asked whether such a permanent grant for the remaining unallocated water

continues to be in the public interest. He noted that the state now retains the right to reconsider water allocations in three circumstances, in the water reservation process, in granting so-called Murphy rights, and in the case of new large water uses. In the water reservation process, public entities are allowed to reserve a block of water for future use. Private entities can make use of reserved water, but the public entity retains ownership of the reservation. In the 1960's, the legislature granted so-called Murphy rights to the Montana Department of Fish, Wildlife and Parks for instream flow on Montana's "blue-ribbon" streams. In doing so, the legislature retained the right for the state to reallocate these rights should it decide that doing so would be in the public interest. The state also maintains control of new water allocations for consumptive uses of 4,000 acre/feet or of a flow of 5.5 cfs or larger. Following these precedents, for the remaining unallocated water in the basin, the state could opt not to grant water use rights in perpetuity so that it could respond to changing future public needs. The state could retain the ability to reallocate new water allocations in the Clark Fork basin by leasing water rather than granting new water right permits. A lease would differ from a water right in three ways. First, the lease would have a limited duration. The length of the lease would probably have to be long enough to support the economic use supported by the lease. Second, a lease implies a payment by the leasee for use of the state's water. Applicants for a new water right permit now pay an application fee, but do not pay for use of the water. Third, to provide a lease, the state would have to ensure the availability of the water being leased. A water right does not provide any assurance of water availability; instead it both allows the right holder to make call on other users with later priority dates and subjects the holder to calls by users with earlier priority dates. To ensure water availability for Clark Fork Basin water leases, the state might acquire water in Hungry Horse Reservoir or Lake Koocanusa.

In discussing this lease approach, Task Force members offered the following comments:

- $ Because a lease would be temporary, it might be perceived as having less value than a water right. This perception might be overcome by the fact that, unlike a lease, any new water right would not guarantee water availability because it would be subject to calls by senior rights holders.
- $ While leasing any currently unallocated water would be a change from the existing system of water right permits, any such leases would not affect existing water rights.
- $ Because the dams that create them are federally owned, the allocation of waters of Hungry Horse Reservoir or Lake Koocanusa may be dedicated to federal purposes such as endangered species, power generation, flood control, and recreation. The state may not be able to obtain water from these projects.
- $ Hungry Horse Dam is a Bureau of Reclamation (BOR) facility, and the statute that created BOR subjected it to state water law. BOR has claimed a large block of Hungry Horse water for irrigation projects that have not been developed. It is not clear if this means that water that would have been used by the irrigation would be available to the state, because the federal government may have put this water to other beneficial uses.
- $ An alternative approach to water leasing that may allow for changed uses in the future is a water bank similar to that used in Idaho in which water rights holders can sell water to the state without risk of water rights abandonment. The state allocates water in the bank.

Task Force Action - The Task Force directed Mr. McLane to prepare separate papers exploring the leasing and the water bank options for the next meeting. No other action was taken regarding either idea.

Discussion of a Hydropower Water Rights, Junior Water Rights, and Future Water Development

In response to the discussion of this topic at the December 2003 Task Force meeting, Representative Jackson considered information about water use and flows and state statutes to determine if Avista's hydropower water rights present a problem for existing and future water use in the basin. He concluded that one cannot demonstrate now that the Avista rights present a problem for the Clark Fork River Basin and especially the Flathead subbasin. A summary of his arguments follows.

Existing Basin Water Resources

The subbasin has abundant surface and groundwater resources. The Flathead drainage has 3,500 miles of streams and 450 lakes including Flathead Lake. The usable water in Flathead Lake is 1,700,200 acre-ft. The total volume is estimated to be 20 to 25 million acre-ft. Hungry Horse Reservoir has 3,467,179 acre-ft usable water storage. The abundance of this water provides recharge to the ground water and most likely is the reason that the Bureau of Mines at Butte has found no decrease in the water table as a result of groundwater development to date. The capacity of groundwater for development is not known, but is considered to be extremely large compared to the small amount of water being used for development each year.

Bad Data and Data Gaps

The existing data base on water appropriations and use can not be used to demonstrate that all of the water has been allocated in the Flathead subbasin because of missing and duplicate data. Denise Deluca stated, "Information describing existing appropriations of water represents the most significant gap in information and knowledge required for basin planning and management. As a whole it cannot be considered to be accurate, consistent, and reliable." Deluca lists many problems with the data. The problems include:

- The failure of existing water appropriations to specify consistently the period of use.
- The rate and volume are not separated by use for each water right identification number. For a given identification number, either a rate or a volume were commonly found, but not both.
- Multiple entries for an identification number were found approximately 43% of the time.
- Priority dates were missing in some cases.

Also, in the water rights data, consumptive uses are not separated from non-consumptive uses. Non-consumptive uses dwarf consumptive uses. According to Marc Spratt, less than 1 million acre-feet in 76LJ (Flathead River) is allocated to consumptive uses while more than 7 million acre-feet is allocated to non-consumptive uses, primarily fisheries. He also found that nearly all of the consumptive use on the South Fork lies in an irrigation right held by the Bureau of Reclamation which has not been utilized. Also, correlation between allocation and actual use or depletion is unknown. With consumptive uses, return flows are not considered. For example, based on records of water use by the City of Kalispell, the return flow from domestic use is between 70 and 73%. With irrigation the return flow is generally believed to be 44% to 50% but could be much higher. In the case of non-consumptive uses, the return flow is generally 100%. These data problems and data gaps prevent one from demonstrating that existing water uses have consumed the available surface or ground water in the Flathead subbasin.

Implication of Basin Water Use for Avista's Water Rights

As of June 2, 1998, Montana's Centralized Water Right Records System identified 26,274 surface water uses the Clark Fork Basin. Thirty percent of these were junior to the most senior water right at Noxon Rapids Dam (35,000cfs with a 1951 priority date). Only 3,125 uses are junior to the most junior Noxon Rapids water right (15,000 cfs with a 1976 priority date). The uses of the water rights junior to Avista's as of June 2, 1998 by number were: 40% irrigation, 32% municipal, 16% stock water, and 12% unknown.

The impact of total basin irrigation on water available to Avista at its Noxon Rapids project is estimated in the following table. Average yearly flow of Clark Fork River near Plains is 14,567,770 acre-feet (45 year average).

Total Basin Acres Irrigated	Water Allotted	Average Used	Average Consumed	Depletion	Percent of Annual Flow
470,000 ac	X 2.5 ft/ac	X .67 ac/ft	X .56	= 440,860 ac/ft	3.03%
428,000 ac	X 2.5 ft/ac	X .67 ac/ft	X .56	= 401,464 ac/ft	2.76%
411,000 ac	X 2.5 ft/ac	X .67 ac/ft	X .56	= 385,518 ac/ft	2.65%

Thus using three different estimates of the basin's irrigated acreage, basin irrigation consumes between 2.65% and 3% of the average annual river flow at Plains.

As is seen in the following table, the growth in irrigation from 1950 to 1980, using data from the 1983 Depletion Task Force Report, consumes only about 0.44% of the average annual flow of the Clark Fork River near Plains.

	Total Acres Irrigated	Water Allotted	Average Used Consumed	Average Depletion	Percent
Prior to 1950	358,000 ac	X2.5 ft/ac	X.67 X.56	= 335,000 ac/ft	2.3%
1950-1980	69,000 ac	X2.5 ft/ac	X.67 X.56	= 64.000 ac/ft	0.44%
Total	427,000ac	X2.5 ft/ac	X.67 X.56	= 400,526 ac/ft	2.75%

However, this figure is overstated because when the irrigated acreage was compiled, the irrigated acres were double counted in the reservoir records and change of use authorizations. According to the Cunningham Report between the years of 1950 to 1980 the additional water use was 60,600 acre-ft which is .4% of the average annual flow in acre-ft at Noxon Rapids. The Cunningham Report further concluded: "In the early 1950s Hungry Horse Dam was completed and has provided flow benefits to WWP (Avista) at both Noxon Rapids and Cabinet Gorge Dams. It can be argued that these modified flow releases from Hungry Horse dam have mitigated any power losses that would have occurred from increased irrigation depletions in the Flathead." Because additional development of irrigated acreage in the basin is very small, the development will not have an adverse impact on Avista's hydro power water supply.

Historic River Flow Data

The USGS data on historic river flow at Polson, St. Regis, and Plains are shown below in Appendices 3, 4, and 5, respectively. These data show that the 45 year average river flow since Avista built its hydroelectric dam at Noxon is higher than the preceding 45 year average. This is true at all three water measuring sites: Polson, St. Regis and Plains. Also, the average for the last 10 years at each site is higher that the average for the last 45 years. There is no evidence from the water flow data for the Flathead River and the Clark Fork Clark River that the water supply for Avista has been adversely affected.

Subordination of Cabinet Gorge's Water Rights

When Washington Water Power began to construct the Cabinet Gorge hydropower facility across the Montana border in Idaho on the Clark Fork, the Montana legislature wanted to ensure that the state's ability to use water in Montana would not be limited by an out-of-state water use. The Montana Legislature passed the following statute in 1951:

> 85-1-122. Clark Fork River. The waters of the Clark Fork River may be impounded or restrained within the state of Montana for a distance not exceeding 25 miles from the Idaho-Montana boundary line by a dam located on said river in the state of Idaho and constructed by any person, firm, partnership or corporation authorized to do business in the state of Montana. Any present or future appropriation of water in the watershed in the state of Montana for irrigation and domestic use above said dam shall have priority over water for power use at said dam.

This language subordinates any Montana water right held by WWP at Cabinet Gorge (36,000 cfs and 26,062,410 ac-ft per year with a priority date of 1951) to future irrigation and domestic water uses upstream of the dam. Cabinet Gorge Dam is located in Idaho but 98% of the reservoir behind the dam is located in Montana. This same provision was not enacted when Noxon Rapids was built which was about the same time. The State of Idaho has a preference clause in its water right statute that places hydropower at the bottom of the preference list. (DNRC)

Options for the Clark Fork Basin Water Management Plan

In light of the preceding information, management options that should be considered for the Clark Fork plan include:

$ Develop local sub-basin water management districts;
$ Encourage water use and depletion data improvement;
$ Promote water conservation;
$ Develop drought plans;
$ Prevent dewatered streams;
$ Consider using ground water to prevent dewatering streams during critical periods;
$ Promote forest management; and
$ Consider subordinating Avista's water rights.

The Task Force agreed to consider Rep. Jackson's arguments and revisit this topic at its next meeting.

BPA Funded Subbasin Planning

Mark Reller, BPA's Montana Liaison for F&W Issues, provided an overview of the sub-basin planning funded by BPA pursuant to the *Columbia River Basin Fish and Wildlife Program* adopted by the Northwest Power and Conservation Council. A copy of Mr. Reller's notes from which he spoke are included below as Appendix 6.

Irrigated Acreage Methodology

Mike McLane reported on behalf of the Task Force's technical committee including Marc Spratt, Denise Deluca, Matt McKinney, and himself. Mr. McLane stated that Ms. Deluca, a Task Force consultant, recommended use of the most recent data set developed in 1997 by the Bureau of Reclamation which found about 471,000 acres of irrigated land in the basin. The Task Force agreed to use these data so long as Chapter 2 discusses the uncertainty inherent in any estimate of irrigated acres. For example, the amount of acres irrigated each years varies significantly according to the water supply, electricity costs, farm commodity costs, etc.

Letter of Support

Marc Spratt presented a document explaining a proposal to obtain federal funding for hyperspectral data collection within the main valleys regions of the upper and lower Flathead Basin.

Task Force Action - The Task Force agreed to lend its support to the proposal, and directed Gerald Mueller to sign a letter to Senator Burns drafted by Marc Spratt and approved by Elna Darrow.

Discussion of the Task Force Work Plan

The Task Force reviewed its work plan and schedule called for future meetings and for producing the plan. It agreed that more than one formal State Water Plan public hearing on the draft management plan would be needed, and that the Task Force should decide on the number and location of these meetings at its February meeting.

Next Meeting

The next meeting was scheduled for Monday, February 2, 2004 at 9:00 a.m. in the DFWP conference room at 3201 Spurgin Road in Missoula. The agenda will include:

- Discussion of the two papers drafted by Mike McLane considering options for future development of water in the basin;
- Discussion of a process for developing flow targets for subbasin drought plans;
- Continued discussion of a hydropower water rights, junior water rights, and future water development; and
- Consideration of the number and location of formal State Water Plan public hearing on the draft management plan.

Appendix 1

Chapter 7
Options to Protect the Security of Water Rights
Draft of January 6, 2004

This chapter identifies options to protect the security of water rights, the first of the three specific tasks set out for the management plan in HB 397. To understand why water right security is important, one must understand the utility of a water right and what would constitute security. Before identifying the options, the existing means for providing protection are discussed.

What Do Secure Water Rights Protect?

As explained in Chapter 3, a water right conveys not the ownership of water but the right to put water to a beneficial use. Thus, secure water rights ensure the ability to use water when it is legally and physically available. Legal availability refers to the "first in time, first in right" rule. Because water is a limited resource, water rights determine how it is to be allocated among competing users. By determining water use, a secure water right also protects the economic interest dependent on the use of water.

What Is Meant by Security of Water Rights?

Security in a water rights context means that the allocation rules are not changing and that their application is both predictable and certain. Security also means that enforcement of water rights is timely and affordable, and that new uses of water should not impact existing uses.

What is Presently Being Done to Protect the Security of Water Rights?

The security of water rights is now addressed through legal and planning processes.

Legal Processes - Since 1979, the Montana Water Court has been conducting a state-wide water rights adjudication to quantify all pre-1973 water rights and clarify their priority dates. As a part of this process, the Montana Reserved Water Rights Compact Commission (Compact Commission) has been negotiating compacts with agencies of the federal government to quantify reserved federal water rights. In the Clark Fork River Basin, the Compact Commission is negotiating compacts with the Confederated Salish and Kootenai Tribes and the United States Forest Service. Beginning in 1973, new water rights are secured through the water rights permitting and change processes administered by the Montana Department of Natural Resources and Conservation (DNRC) pursuant to the Montana Water Use Act. Water rights holders on streams that have an enforceable decree issued by state or federal courts or through the state-wide adjudication can enforce their rights by hiring a water commissioner to implement the decree. Some basins have been closed to the issuances of new surface water rights either through administrative rule, legislative action, or a negotiated compact. Basin closures protect existing water right holders by prohibiting new junior water uses, thereby eliminating the need to spend time and money objecting to proposed new permit applications on streams which are already over appropriated.

Individual water rights holders can also seek to protect their rights through litigation in Montana courts. In the case of water right permits issued by DNRC after 1973, an individual can seek enforcement by DNRC. As discussed in Chapter 4, DNRC will first seek voluntary compliance, but can then request that the court impose a fine for each day that a water rights permit violation exists.

Planning Processes - In addition to legal processes, Clark Fork River Basin water rights holders and water interests are working together in collaborative watershed planning groups and through other organizations such as associations, irrigation districts. These groups engage in activities such as water data collection, maintenance and construction of water storage and conveyance facilities, drought planning, water quality improvement and riparian area restoration projects, dispute resolution, and water education.

New Options to Protect the Security of Water Rights

Complete the Water Rights Adjudication - The most important option is to complete the adjudication of water rights in the Basin. Until the adjudication is completed no water right will be secure. Allocation of water within the basin cannot be enforced until the quantity and priority of all Basin water rights is determined. Given the lack of any completion goals and the inadequate staffing and funding resources now provided to two agencies carrying out it out, the Water Court and the DNRC, no one has any idea when the adjudication may be finished. The 1979 legislation which set the adjudication in motion was accompanied by a fiscal note indicating that 100 full time equivalents (FTE's) would be required to conduct the work. However, the Montana Water Court now has only six water masters and three administrative support positions in addition to the chief water judge. The DNRC has only 9.8 FTEs assigned to assisting the Water Court deliberations. Examples of how completing the adjudication would be facilitated include the following actions. Establish specific dates as goals for completing key steps in the process, including:
4 years to complete the DNRC claims examination;

- 2 additional years to complete Water Court issuance of preliminary decrees; and
- 4 additional years for the Water Court to issue enforceable decrees throughout the Basin.
- Provide additional resources for the adjudication process, including:
  - Additional funding for the Water Court and the DNRC; and
  - Re-prioritize DNRC's existing resources to focus on the adjudication

Resolve the Status of the Salish and Kootenai Tribal Water Rights - The adjudication cannot be completed until the status of the Tribes' water rights is definitively resolved. The state and the Salish and Kootenai Tribes should move as rapidly as possible to resolve the status through negotiation or litigation.

Improve the Accuracy of the Water Rights Adjudication - Under the existing adjudication process, final decrees may not resolve inaccurate water rights claims. Accuracy is important because inaccurate decrees may deny water to individual water rights holders to which they are legally entitled and because the federal statute which subjects federal water rights, including federal reserved rights, to state adjudication processes, requires that the adjudication be "sufficiently accurate." Presently, the Water Court examines the accuracy of

water rights claims only if individual rights holders file objections to them in the Court process. If no one objects, bogus claims would be included in final decrees. Although it has ruled that it has the authority to examine claims itself, the Court is not doing so. This problem could be alleviated in one of two ways. First, the Court could examine claims and resolve those it finds to be inaccurate. Second, an institutional objector such as the DNRC or the Montana Attorney General could be empowered and funded to examine claims and to object to those found to be inaccurate. Adequate funding would be necessary because of the number and complexity of the claims which must be examined. Given the time and money which has been and continues to be devoted to the adjudication, all reasonable efforts should be made to ensure that the adjudication results in durable and accurate water rights.

Relieving the Burden on Existing Water Rights Holders - Water rights holders must initiate and fund legal actions in administrative proceedings and the courts to enforce their water rights. These actions are sufficiently time consuming and expensive to discourage enforcement. Also, because of a combination of factors including the lack of resources, the requirement that it obtain a court order to do so, and an apparent lack of willingness to do so, DNRC rarely exercises its existing enforcement authority on behalf of individual water rights holders. Alternative actions that would lower the enforcement burden on individual water rights holders include:

- $ Provide more resources so that DNRC can use its existing authority to verify water rights;
- $ Provide more resources so that DNRC can use its existing authority to enforce water rights;
- $ Change Montana law to allow a judge to award attorney fees to a private party bringing an action for an illegal use of water;
- $ Empower DNRC to investigate and regulate water use in basins without an enforceable decree at least until a final decree is issued;
- $ Empower DNRC to issue fines for violations of the Montana Water Use Act using authority similar to that exercised by the Montana Department of Environmental Quality in enforcing air and water quality standards;
- $ Require DNRC to appoint water commissioners to enforce decrees;
- $ Require all water rights holders under a decree to divide the water commissioner costs according to the percentage share of the total water rights;
- $ Authorize DNRC staff to serve as a court appointed water master.
- $ Utilize court appointed or DNRC mediators to resolve enforcement issues; and
- $ Require DNRC to initiate administrative rule making to establish criteria for objecting to water rights permit and change applications that increase the burden on applicants while reducing the burden on existing rights holders.
- $ Change Montana law to prevent a violator of the Montana Water Use Act from getting a water permit for some period of time;
- $ Institute surface and/or ground water rights basin closures; and
- $ Condition new DNRC permits to require measurement of flow and volume of water

diversions.

Applying New Technology - Application of geographical information systems and increasing coordination among data collectors and examiners would improve water regulatory and planning activities.

Assess Ground Water and Aquifer Characteristics - Ground water is becoming a more important water resource. EPA regulations encourage ground water to be used as the source of municipal water supplies. Unfortunately, the Basin's ground water resources are not well known. Additional study is needed to determine ground water use, recharge rates, and aquifer capacity.

Appendix 2
Chapter 9
Options for Conserving Water
Draft of December 9, 2003

This chapter identifies options for conserving water in the future, the third of the specific tasks set out for the management plan in HB 397. This chapter begins with a definition of conservation, continues by describing existing activities in the basin that promote conservation, and then sets out additional options for conserving water in the future.

What Does Conserving Water Mean?

To some, conservation has the connotation of saving rather than using. In this plan, conservation means the *long-term, sustainable use* of water resources. Water can be used beneficially through a diversion and instream. Water can be conserved by preserving the qualities that maintain instream uses as well as those that allow long-term sustained use for diversionary uses such as irrigation, stock watering, municipal, etc.

What is Presently Being Done to Promote Water Conservation in the Basin?

Current activities for water conservation in the basin may be identified in terms of one of three categories: administrative, management, or education and research.

Administrative

The DNRC takes administrative actions that promote long-term, sustainable water use by regulating water use through Montana's system of water rights. The rights, which can now be bought and sold and leased, create the legal framework protecting individual water uses. Water rights may also include use efficiency standards/guidelines designed to prevent waste and the ten year period after which a water right may be declared abandoned for non-use.

Management

Agencies, organizations, and individuals also conserve water through management activities. Individuals and water user organizations conserve water by experienced-based management activities such as timing irrigation, measuring water diversions, maintaining headgates and irrigation ditches, and metering urban water uses. Agencies and non-governmental organizations such as the Natural Resource Conservation Service (NRCS), Montana Rural Water Systems, Inc., the DNRC , conservation districts, and water quality districts, provide funding and technical assistance to assist public and private water managers.

Some management activities designed to increase the "efficiency" of water use may, however, be counterproductive because they decrease water availability later in the year or for other water users or because they increase water consumption. Activities that may be

counterproductive include converting flood irrigation to sprinkler which can significantly reduce return flows to surface water, and using water salvage to increase crop production, thereby increasing water consumption through increased evapotranspiration and evaporation.

Particularly significant conservation management activities occur during periods of drought. In some areas, drought is now managed by managing water rights. In sub-basins with an enforceable water rights decree water rights holders can opt to petition district court for the appointment of a water commissioner who then allocates water pursuant to the decree (see Chapter 4). The Flint Creek Valley is an example of this approach. In other sub-basins, droughts are managed through development and implementation of voluntary drought plans. The Big Hole, Jefferson, and Blackfoot river basins use such plans. While each plan is unique, the three share several characteristics. The three plans:

- Were developed voluntarily, but were motivated by some combination of the following factors:
  - A perceived threat such as an Endangered Species Act listing (grayling in the Big Hole and bulltrout in the Blackfoot), a requirement to measure all irrigation diversions, etc.;
  - Economics;
  - A sense of community, i.e. we are in this together;
  - The desire to preserve the quality of life; and
  - Individual personalities and social pressure;
- Were designed to meet fishery or instream flow objectives;
- Were based on trigger flows;
- Are locally implemented;
- Share shortages with sportsmen and sportswomen through fishing closures;
- Contain long-term water conservation measures such as ditch lining, wells for stock watering, and water trading; and
- Are funded through grants and donated services from agencies and individuals. (The Blackfoot plan annual costs are $8-10,000).

Education and Research

Several entities now provide water conservation educational materials and activities: NRCS, DNRC, conservation districts, water quality districts, the county extension program, Montana Rural Water Systems, Inc., and public and private water companies. The Montana Watercourse has available school curricula addressing water conservation. The Montana Bureau of Mines and Geology is conducting research to characterize the ground water resource throughout the state including the Clark Fork Basin.

Future Alternative Activities for Conservation of Water

Future alternatives for conserving water, i.e. providing for long-term, sustainable water use, can also be categorized in terms of administration, management and education and research.

Administration

- $ Improve DNRC's system for handling and managing water data to make it more accessible to the public.
- $ Develop incentives for efficient use.
- $ Require measurement of water use for new water permits and change authorizations.
- $ Hold the United States Forest Service forest management accountable for water yield.
- $ Set target flows in the State Water Plan for water discharge from each of the major watersheds in the basin.
- $ Encourage creation of smaller subbasin planning entities.
- $ Adopt local government model water conservation ordinances.
- $ Encourage counties to require water meters in new subdivisions.
- $ Encourage local government-owned water systems to require water meters.
- $ Create water quality districts.
- $ Coordinate DNRC and DEQ well requirements to ensure cumulative effects analysis (DEQ requires pump test resulting in 1.5 times design flow rate; DNRC requires pump test showing design flow rate).
- $ Provide legal protection for ground water provided by irrigation.
- $ Provide legal protection for areas in which surface waters recharge ground water.

Management

- $ Measure water uses and diversions.
- $ Limit diversions to only what is needed for the beneficial use.
- $ Store available, unneeded water.
- $ Manage ground water provided by irrigation.
- $ Improve water conveyance efficiency.
- $ Develop basin water management and drought plans.
- $ Identify, manage and protect areas in which surface waters recharge ground water.
- $ Participate in the Source Water Protection Program.
- $ Manage the supply side, e.g. use artificial recharge.

Education and Research

- $ Continue existing water conservation programs.
- $ Provide education about activities that might affect ground water recharge and quality.
- $ Emphasize that wasting water also wastes electricity.
- $ Research the connection between ground water infiltration and base stream flow.

- $ Determine ways to conserve water and quantify the potential volumes.
- $ Research the connection between the basin vegetation and base flow.
- $ Determine the seven day average low flow in a ten year period which is sometimes known as 7Q10.
- $ Provide for long-term, coordinated education for water users.

Appendix 3

USGS CLARK FORK at Polson 1911-1955

Year	Avg Annual (AF)		
1911	7,984,607		
1912	7,389,849		
1913	9,713,128		
1914	7,130,394		
1915	5,85,9483		
1916	1,1874,254		
1917	6,719,174		
1918	8,819,944		
1919	6,114,458		
1920	7,072,883	**8,067,817**	**10 Year Avg**
1921	9,660139		
1922	7,728,506		
1923	8,450,317		
1924	7,293,750		
1925	1,1154,441		
1926	6,19,6210		
1927	Incomplete Data		
1928	Incomplete Data		
1929	6,40,2635		
1930	6.148,334	**7,904,292**	**10 Year Avg**
1931	5,390,085		
1932	8,99,1475		
1933	11,119,581		
1934	10,31,9817		
1935	7,904,423		
1936	6,867,666		
1937	5,922,158		
1938	7,040.490		
1939	7303,974		
1940	4,930,317	**7,578,999**	**10 Year Avg**
1941	4.424785		
1942	7,262.680		
1943	9,934.296		
1944	4.070,462		

1945	6411,355			
1946	9093,849			
1947	10.382,898			
1948	9.405,388			
1949	7.456,690			
1950	11,219199	**7,966,160**	**10 Year Avg**	
1951	11,418,238			
1952	7,77,6634			
1953	7,043,597			
1954	10,221,441			
1955	8,265,037		**7,646,423**	**45 Year Avg**

USGS CLARK FORK at Polson 1956-2000

Year	Avg Annual (AF)		
1956	10,846,636		
1957	7,879,115		
1958	6,264,276		
1959	12,584,013		
1960	9,075477	**9,117,446**	**10 Year Avg**
1961	9,326,839		
1962	8,237,772		
1963	7,279,480		
1964	9,987,868		
1965	11,098,528		
1966	8,924,971		
1967	9,238,337		
1968	7,977,608		
1969	9,54,7837		
1970	7,695,058	**8,931,630**	**10 Year Avg**
1971	10,457,429		
1972	10,357,232		
1973	6,078,354		
1974	12,055,822		
1975	8,921,999		
1976	9,448,311		
1977	5,468,944		
1978	8,222,249		
1979	7,593,326		
1980	6,607,013	**8,521,068**	**10 Year Avg**
1981	9,199,124		
1982	8,395,717		
1983	8,174,004		
1984	7,062,874		
1985	8,042,938		
1986	7,584152		
1987	6,251,276		
1988	5,695,417		
1989	7,819,935		
1990	9,834,498	**7,805,994**	**10 Year Avg**
1991	10,909,958		
1992	5,989,445		

1993	7,274,518			
1994	5,577,454			
1995	7,281,404			
1996	11,959,390			
1997	11,710,464			
1998	6,841,338			
1999	7,920,202			
2000	7,336,223	**9,263,489**	**8,485,263**	**45 Year Avg**
			8,065,843	**90 year avg**

Appendix 4

USGS CLARK FORK at St. Regis 1911-1955

Year	Avg Annual (AF)		
1911	No Data		
1912	6,655,491		
1913	7,578961		
1914	5,319.918		
1915	4,093,403		
1916	8,389,799		
1917	8,174,456		
1918	7,547,604		
1919	3,668,233		
1920	5,578,513	**6,334,042**	**10 Year Avg**
1921	6,084,776		
1922	5,724.384		
1923	Incomplete Data		
1924	Incomplete Data		
1925	Incomplete Data		
1926	Incomplete Data		
1927	Incomplete Data		
1928	Incomplete Data		
1929	3,599,551		
1930	3,978,612	**4,846.831**	**10 Year Avg**
1931	2,419,619		
1932	4,464,179		
1933	6,214,604		
1934	5,997,931		
1935	3,743,974		
1936	4,130,504		
1937	2,627,244		
1938	5,004,927		
1939	3,771,906		
1940	3,033,309	**4,140,820**	**10 Year Avg**
1941	2,777,390		
1942	4,516,954		
1943	7265,555		
1944	3,097,324		
1945	3,859,440		
1946	4,790,032		
1947	6,659560		
1948	7,774,708		
1949	5,496229		
1950	7,056,968	**5,329,416**	**10 Year Avg**
1951	7,155,762		

1952	5,384,624			
1953	5,171966			
1954	6,064,972			
1955	5,405,853		**4,450,650**	**45 Year Avg**

USGS CLARK FORK at St. Regis 1956-2000

Year	Avg Annual (AF)		
1956	7,137,866		
1957	5,252,762		
1958	5.460,420		
1959	7,144,280		
1960	4,879,722	**5,905,823**	**10 Year Avg**
1961	4.625,557		
1962	5.735.058		
1963	4.838,865		
1964	6258.752		
1965	7,644.736		
1966	4,088.397		
1967	6,135278		
1968	5,408,077		
1969	6,006,449		
1970	5,625,382	**5,636,655**	**10 Year Avg**
1971	7,021.331		
1972	7,943683		
1973	2,926.311		
1974	7,337,518		
1975	7,436.781		
1976	7,602,564		
1977	2,603,383		
1978	5,985.574		
1979	4,623,258		
1980	5,616,141	**5,909,654**	**10 Year Avg**
1981	5,527,140		
1982	7,167,604		
1983	4,687,313		
1984	5,242,100		
1985	4,218,348		

1986	5,140,628			
1987	2.802,379			
1988	2,994,966			
1989	4,601,100			
1990	4,786,143	**4,716,772**	**10 Year Avg**	
1991	4,790,032			
1992	2,918,415			
1993	4,104,350			
1994	3,149,533			
1995	5,133,148			
1996	7,419,561			
1997	8,472,677			
1998	4,861,397			
1999	5,522,964			
2000	3 722,095	**5,480,310**	**5,389,396**	**45 Year Avg**
			4,920,023	**90 year avg**

Appendix 5

USGS CLARK FORK at Plains 1911-1955

Year	Avg Annual (AF)		
1911	13,935,095		
1912	13,766,340		
1913	17,40,5335		
1914	12,940,621		
1915	10,972,214		
1916	20,25,4893		
1917	1,7490,665		
1918	17,160,460		
1919	10,340,607		
1920	13,481,240	**14,774,767**	**10 Year Avg**
1921	15,922,216		
1922	13,946,502		
1923	14,158,061		
1924	11,526,364		
1925	17,698,038		
1926	10,024,788		
1927	20,293,339		
1928	19,481,230		
1929	10,368,890		
1930	10,355,970	**14,377,540**	**10 Year Avg**
1931	7,909,706		
1932	14,126,336		
1933	17,794,062		
1934	16,655,140		
1935	12,043,437		
1936	11,563,446		
1937	8,904,145		
1938	12,46,3344		
1939	11,393878		
1940	8,190,419	**12,106,391**	**10 Year Avg**
1941	7,303,190		
1942	12,092,690		
1943	17,627,312		
1944	7,449,142		
1945	10,510472		
1946	14,203,578		
1947	17,718,957		
1948	17,945,962		

1949	13,517236			
1950	18,736,398	**13,730,494**	**10 Year Avg**	
1951	18,837,284			
1952	13,414,817			
1953	12,671,042			
1954	16,535,049			
1955	14,202,263		**13.901.164**	**45 Year Avg**

USGS CLARK FORK at Plains 1956-2000

Year	Avg Annual (AF)		
1956	18,915,457		
1957	13,920,319		
1958	12,658,704		
1959	20,484,328		
1960	14,487,684	**13,564,270**	**10 Year Avg**
1961	14,472,818		
1962	14,626,494		
1963	12,543,472		
1964	16,773,154		
1965	19,222,868		
1966	13,285,125		
1967	15,870,411		
1968	14,013,430		
1969	16,623,405		
1970	14,289,981	**15,172,116**	**10 Year Avg**
1971	18,227,999		
1972	19,366,220		
1973	9,348,542		
1974	20,161,548		
1975	17,004636		
1976	17,737,036		
1977	8,358,136		
1978	15,187,038		
1979	13,218,500		
1980	13,424,493	**15,203,415**	**10 Year Avg**
1981	15,829,504		
1982	16,090,019		
1983	13,286,984		
1984	12,781,949		
1985	12,988859		

1986	13,694,753			
1987	9,665,463			
1988	9,232,653			
1989	13,195,207			
1990	15,418,159	**13,218,355**	**10 Year Avg**	
1991	16,430,119			
1992	9,331,744			
1993	12,212,204			
1994	9,254,797			
1995	12,996,423			
1996	20,186,811			
1997	21,173,467			
1998	12,335,687			
1999	13,963,423			
2000	11,259,636	**15,456,247**	**14,567,770**	**45 Year Avg**
			14,234,467	**90 year avg**

Appendix 6

WHO – WHAT – WHEN – WHERE – WHY
Of Subbasin Planning

WHY - the Northwest Power Act of 1980
http://nwcouncil.org/library/poweract/default.htm

Summary

PACIFIC NORTHWEST ELECTRIC POWER PLANNING AND CONSERVATION ACT
16 U.S.C. §§ 839-839h, December 5, 1980.

"**Overview.** The Act addresses the impact on fish and wildlife of hydroelectric dams on the Columbia River. The Act establishes the Pacific Northwest Electric Power and Conservation Planning Council and directs the Council to adopt a regional energy conservation and electric power plan and a program to protect, mitigate and enhance fish and wildlife on the Columbia River and its tributaries. The Act also sets forth provisions the Administrator must follow in selling power, acquiring resources, implementing energy conservation measures, and setting rates for the sale and disposition of electric energy. "

"Purposes. The Act enumerates several purposes concerning the supply of electric power in the Pacific Northwest. Among other things, the Act is intended to: assure the Pacific Northwest of an adequate, efficient, economical and reliable power supply; provide for the participation and consultation of the Pacific Northwest states, local governments, consumers, customers, users of the Colombia River System (including federal and state fish and wildlife agencies and Indian tribes), and the public; ensure development of regional plans and programs related to energy conservation; renewable and other resources; protecting, mitigating, and enhancing fish and wildlife resources; facilitating the planning of the region's power system; and providing environmental quality. The Act also is intended to protect, mitigate and enhance the fish and wildlife, including related spawning grounds and habitat, of the Columbia River and its tributaries, particularly anadromous fish."

To accomplish the fish and wildlife objectives, the Council through rulemaking, adopts the "Fish & Wildlife Program". This document is ***renewed every 5*** years under the provisions of the Act.

WHO

"This document is the Council's Columbia River Basin Fish and Wildlife Program. As a planning, policy-making and reviewing body, the Council develops and then monitors implementation of the program, which is implemented by the Bonneville Power Administration, the U.S. Army Corps of Engineers, the Bureau of Reclamation and the Federal Energy Regulatory Commission and its licensees."

As far as subbasin plans are concerned- Principle contacts:

Lead entities have been determined

Brian Marotz for the State
Lynn Decharme for the Tribes

Kerry Berg of the council.

WHAT

The Program has evolved over the years from what some called a "Christmas tree approach" , or a "shot-gun- approach". It was criticized for lacking focus and efficiency. In the Late 90's, thanks to formation of an Independent Science Group and some critical review of the program by that group, the Council, trimed the sails, and started refining it's approach to fish and wildlife management.

"The fundamental elements of the program as revised are the *vision*, which describes what the program is trying to accomplish with regard to fish and wildlife and other desired benefits from the river; basinwide *biological performance objectives*, which describe in general the fish and wildlife population characteristics needed to achieve the vision; implementation *strategies*, which will guide or describe the actions needed to achieve the desired ecological conditions; and a *scientific foundation*, which links these elements and explains why the Council believes certain kinds of actions should result in desired habitat conditions and why these conditions should improve fish and wildlife populations in the desired way." (SOURCE MAINSTEM AMMENDMENTS)

It also re-organized the structure of how it looks at the basin. It embarked on an approach defined by geographic sub-sections of the Columbia Basin. These were called Provinces. The provinces are groups of adjacent subbasins with similar ecological features. **There are eleven Provinces and more than 50 subbasins**. Each subbasin will generate a locally developed plan called a "Subbasin Plan".

"With the subbasin plans in place, the program will be organized in three levels: 1) a basinwide level that articulates objectives, principles and coordination elements that apply generally to all fish and wildlife projects, or to a class of projects, that are implemented throughout the basin; 2) an ecological province level that addresses the 11 unique ecological areas of the Columbia River Basin, each representing a particular type of terrain and corresponding biological community; and 3) a level that addresses the more than 50 subbasins, each containing a specific waterway and the surrounding uplands."

A Subbasin Plan contains:

an Inventory: This is a listing of the current fish and wildlife efforts that are in place in the subbasin: hatcheries, habitat restoration, protection, and the management plans that are already being implemented.

An **Assessment:** An assessment describes the conditions and characteristics in the subbasin. What are the opportunities and needs for restoration?

A Management Plan

Management Plan contains:

- Vision/Goals **Vision/Goals:** This describes what the plan seeks to achieve: restore fish runs, increase harvestable fish, and restore wildlife habitat

- Objectives that measure progress **Objectives that Measure Progress:** The Council's Fish and Wildlife Program includes *basinwide objectives* for the Columbia Basin that provide a regional yardstick for the subbasin plans. For example, the 2000 Program's objectives include increasing total adult salmon and steelhead runs above Bonneville Dam by 2025 to an average of 5 million annually in a manner that supports tribal and non-tribal harvest.

- "Limiting factors" **Limiting Factors:** Answers the question, "what are the problems that keep fish and wildlife populations within the subbasin from reaching full potential?" Might include passage barriers at culverts and falls; lack of adequate screening; lack of habitat for rearing juveniles.

- Strategies to address **Strategies to Meet the Objectives:** how to address the limiting factors: restore passage through a particular barrier; provide screens; improve water quality.

  Projects **Projects:** These are basic descriptions of projects that would achieve the strategies, e.g., build a fishway at Sunny Creek. Also included here is a budget and monitoring and evaluation plan to assess results.

Maximize local participation, knowledge and consensus: The idea of subbasin planning is to get beyond just the traditional fish interests and the tribes and help a broader group of locals work together to find common goals and needs. A key element of successful subbasin plans will be *broad* participation and agreement.

RoLE OF SUBBASIN plans- become the source of specific actions and projects to be recommended to BPA funding and implementation. Also wills have roll in recovery planning for NOAA listed fish – could be adopted a local recovery plans. USFWS have expressed interest in the plans but not to that level.

Three levels of review
Council
Public
Scientific – internally consistent, scientifically sound - ISRP

WHEN AND WHERE

MDR note: under the current schedule, draft plans will be submitted by March of 04, then reviewed by the ISAB, and concurrently reviewed by public, adjusted as needed based on this feedback, and adopted by council by the end of '04.

LIST Products available now and link to MT info.

http://www.nwcouncil.org/fw/subbasinplanning/admin/progress/default.asp
status report

http://fwp.state.mt.us/FlatheadSubBasinPlan/

state home page for subbasin plan

http://www.fwp.state.mt.us/flatheadsubbasinplan/031601flathead.pdf
summary Plan
will get to more details in a moment.

In addition, there is a separate, but related section of the Program called the Mainstem Plan.

"The mainstem plan is to contain the specific objectives and action measures that the program calls on the federal operating agencies and others to implement in the mainstem Columbia and Snake rivers, including especially the operations of the hydrosystem, to protect, mitigate and enhance fish and wildlife affected by the development and operation of the hydroelectric facilities, while assuring the region an adequate, efficient, economical and reliable power supply. The mainstem plan includes objectives and measures relating to, among other matters:

- the protection and enhancement of mainstem habitat, including spawning, rearing, resting and migration areas for salmon and steelhead and resident salmonids and other fish;
- system water management;
- passage spill at mainstem dams;
- adult and juvenile passage modifications at mainstem dams;
- juvenile fish transportation;
- adult survival during upstream migration through the mainstem;
- reservoir elevations and operational requirements to protect resident fish and wildlife;
- water quality conditions; and
- research, monitoring and evaluation."

(source mainstem plan)

The 2000 program addresses all of the "Four Hs" (see sidebar) of impacts on fish and wildlife — **hydropower, habitat, hatcheries and harvest**.
The mainstem plan is primarily focused on hydropower operations and to some extent the habitat affected by operations. The subbasin plans will address in more detail habitat as well as hatcheries and may have some input on harvest.

Bonneville Funds- Direct Program- $139M /year, also we fund certain projects at the dams taken on by the project owners, the COE and the BOR, these are called reimbursable projects. Finally we track foregone revenues associated with changes in power operations such as spill or seasonal shifts in water.

Sub-basin planning activities had $15.2 million allocated to them. Contracted through the NPCC directly to entities leading the subbasin planning.

So that is the big-picture overview of the Council's Fish & Wildlife Program. **Lets look at more details in the Flathead / Clarkfork system.**

The Clarkfork is considered a sub-basin under the Council's program. As are the Bitterroot, Blackfoot, Flathead and Kootenai watersheds. In this first round of subbasin planning, only the Flathead and Kootenai appeared ready to take on the effort of writing a "subbasin assessment" and "a subbasin plan". Also these projects are the primary affected areas associated with the Federal Columbia River Power System. The act is focused on the federal system, but can and

has addressed FERC licenced projects as well. In the next planning round (3 to 5 years out), it will be possible to extend this effort to the other Montana subbasins as well.

Gerald invited me here to day to discuss how the Program, and other factors will affect the Clarkfork in the near term. Let me do that by providing more detail on the Mainstem Plan and the Flathead subbasin planning efforts.

The Flathead subbasin planning effort is well underway.

Lead entities have been determined

Brian Marotz for the State

Lynn Decharme for the Tribes

Assesment completed: Link

Conclusions of the flathead basin assessement- key points, limiting factors

Alteration of the Littoral Zone

The Flathead Subbasin has experienced significant growth and development over the past twenty years, much of it near or adjacent to lakes and streams. The result has been the loss of significant riparian and wetland areas,

Altered Hydrograph

Hydropower related discharge fluctuations on the South Fork and upper mainstem of the Flathead River have resulted in a wider zone of water fluctuation, or *varial zone,* which has become biologically unproductive. Reduction in natural spring freshets due to flood control has reduced the hydraulic energy needed to maintain the river channel and periodically resort river gravels. Collapsing riverbanks caused by intermittent flow fluctuation and lack of flushing flows have resulted in sediment buildup in the river cobbles, which is detrimental to insect production, fish food availability, and security cover. Changes in the annual hydrograph for the lower Flathead River cause the normally vegetated varial zone to become abnormally inundated.

Cultural Eutrophication

Open-water primary production is a main measure of water quality in lakes like the Flathead. This is a very sensitive measure of the ability of a lake to grow algae. Lakes polluted with plant-growth nutrients, particularly nitrogen and phosphorus, typically have high rates of primary production, poor water clarity due to blooms of algae, and bad tastes and odors associated with the decomposition of the blooms. These

Floodplain Alterations

Channelization, road fill, bank armoring and other encroachments along stream segments have narrowed channels and limited meander inside floodplains. This has created shorter channels, steeper gradients, higher velocities, loss of storage and recharge capacity, bed armoring, and entrenchment.

Fragmentation of Habitat

Fish migrations have been blocked from other man-caused barriers, including road culverts, dewatered stream reaches, irrigation diversions, etc.

Non-native Species Interactions

Non-native species now threaten the diversity and abundance of native species and the ecological stability of ecosystems in the subbasin.

Sedimentation

Logging activities, road building, residential development, and agricultural practices have increased the amount of fine sediments entering streams.

Temperature Changes

The removal of riparian vegetation, especially trees and overhanging shrubs, has changed stream water temperatures, making the water warmer in the summer and colder in the winter.

Flathead summary does contain references to IRCs (explain) , flow stabilization, and IFIM. But real driver is Mainstem amendements:

Mainstem Amendments for HH
20/20 rule- change the draft to 10 feet per summer, and protract it out over September, except in the 20% driest years, allow the draft to go to 20'

http://www.nwd-wc.usace.army.mil/TMT/index.html
water management Plan

Hungry Horse will be operated during the winter season to achieve a high probability[17] of water surface elevations within 0.5 foot of the flood control rule curve by April 10 and to refill by June 30, except as specifically provided by the TMT.[18]

5.4.2 Refill

During the spring, the Action Agencies shall operate Hungry Horse to contribute to meeting the flow objectives and refill by approximately June 30.[19]

5.4.3 Summer anadromous fish

During the summer (July and August) the Action Agencies shall operate Hungry Horse to help meet the flow objectives. The summer reservoir draft limit is 3,540 ~~3550~~ feet by the end of September.[20] This limit determines the maximum draft available for summer flow augmentation from Hungry Horse.

MDR NOTE: the HH operation proposed by mainstem amendement shifts water into the fall, early winter period, the end of year elevation is not changed. (explain) Forecast uncertainty.

var-q flood contol - less brute force, more finesse approach, shallower draft and higher spring flows in dry years. No change from past in above average water years. Has been implemented at Libby and HH past two flood seasons, under interim EA while final EIS is being prepared - GET LINK

Var-q - key point, only in average or dryer years. Alternative flood control
www.usbr.gov/pn/programs/VARQ/

MAINSTEM amendments also affect spill in the lower river
Expensive- controversial in regard to how much to spill and when
Studies showing high spill levels late in summer – few fish present.

BIOP
The BiOp addresses FCRPS operations in detail: The BiOp addresses the federal hydro system operations and improvements: flow augmentation and spill operations during salmon migration seasons, and well as capital improvements such as fish ladders and fish-friendly turbines and support safe passage past the dams. It also describes "off-site mitigation" actions that will be taken in the other "h's", particularly habitat.

http://www.salmonrecovery.gov/Remand.shtml

National Wildlife Federation et al v. National Marine Fisheries Service et al. challenged the National Marine Fisheries Service (NOAA Fisheries) 2000 Biological Opinion (BiOp) on operation of the Federal Columbia River Power System for salmon and steelhead. In June 2003, Judge James A Redden

remanded, or handed back, the 2000 BiOp to NOAA Fisheries to resolve several deficiencies including: reliance on federal mitigation actions that have not undergone section 7 consultation under the Endangered Species Act; and reliance on range-wide off-site non-federal mitigation actions that are not reasonably certain to occur. In a subsequent "minute order," the Judge denied plaintiffs' motion to vacate the Biological Opinion and it will remain in place as deficiencies are addressed.

NOAA Fisheries will provide a status report to the Court every 90 days during the year.

"you should also recognize that on the schedule we have committed to the court and it is a schedule to which we will hold, we will be delivering a new draft or a revised draft Biological Opinion to the court in March (2004), with a final opinion in place in June." Bob Lohn
http://www.nwcouncil.org/news/2003_12/lohn.htm

BIOP REACHES TO MONTANA:

BIOP for HH - 20' summer draft – var-q, 75% refill probability

http://www.salmonrecovery.gov/R_Analysis.shtml
NOAA Fisheries white Papers

www.nwr.noaa.gov
BIOP implemtation report

THE REMAND has been viewed through at least two perspeictives
One: that NOAA fisheries will be gun shy and reluctant to allow
Changes called for in the Mainstem amemnedments

Two: the remand opens the door to get changes implemented in a formal
Process

OLDER Lawsuit- Judge Hogan: Issue of Hatchery Fish-
NOAA fisheries working out if the role of hathery fish in recovery.
At issue, do you count fish of hatchery origin in determining if fish are at jeopardy, or at recovery levels.
Important because fish numbers for salmon and steelhead at ***very high levels*** last several years.
While many wild stocks are up, much of the upswing attributed to fish of hatchery origin. -
Genetic issues, competition, harvest rates, disease issues, etc.

Also another BIOP
USFWS- Sturgeon and Bull Trout
Has operational issues at HH – Mainly Ramping Rates and Minimum Instream Flows in the south fork and at Columbia Falls.

http://www.r1.fws.gov/finalbiop/Summary.PDF

Operations of Hungry Horse Dam

(*Section 3, proposed action; section 11.A.1, term and condition 2*)
- Operate to meet minimum flows
sliding scale, based on available flows, at SF and mainstem Flathead River (measured at Columbia Falls)
- Meet ramping rates and conduct studies to include:
maximum change in daily and hourly flows
ramping rate (up and down)
- Reduce or minimize "second peak"between flows for sturgeon and anadromous fish
- Implement modified flood control approach (VARQ) beginning 10/00

Region 6 (mt.) , Region 1- dichotomy

http://pacific.fws.gov/bulltrout/

clarkfork recovery unit:
http://pacific.fws.gov/bulltrout/recovery/Chapter_3.htm
contains core areas and recovery targets

Chapter 3 - Clark Fork River 184
1.4 Operate dams to minimize negative effects on bull trout.
1.4.1 Reduce reservoir operational impacts. Review Flathead Lake and Hungry Horse Reservoir operational concerns (*e.g.*, water level manipulation) and support operating recommendations that provide enforceable drawdown limits and refill guidelines through
Federal Energy Regulatory Commission license (Kerr) and/or Federal consultation (Hungry Horse Reservoir; USFWS Biological Opinion). The Variable Flow Flood Control model should be implemented by water managers to provide comprehensive, long-term, balanced, and predictable allocation of water resources from Hungry Horse Reservoir that will limit the duration and frequency of deep reservoir drawdowns, improve reservoir refill probability, and produce a more naturally shaped dam discharge pattern downstream (USFWS 2000). Once implemented, these strategies must be evaluated to determine the effects on bull trout recovery.

1.4.2 Provide instream flow downstream of dams. Maintain or exceed recommended instream flow levels in the lower South Fork Flathead River (USFWS 2000), using results of current research, and minimize peaking flows in the mainstem Flathead River
downstream of Hungry Horse Dam. Consider bull trout concerns
when developing flood control release patterns.

Kerr Mitigation- drought management Plan – Flathead Lakers page

Kerr is important as it to some degree re-regulates HH releases.

Ferc Licence Sets lake levels and minimum flows for Flathead Lake.
Shoots for flows that resemble a natural hydrograph, with higher spring flows that decline across the summer . Flows designed for health of the Lower Flathead River and Lake levels for recreation.

http://www.flatheadlakers.org/flathead_lake_basin/lake_levels/levels/plan.pdf

Some internal conflict in the ferc Licence, can't meet both river and lake criteria in very dry years. To resolve that conflict, a process was started to derive a product called the Drought management plan. An EIS is underway.

In that effort there has been some effort to get HH to pick up the slack. Var-q would allow some higher spring flows, but no guarentee that the timing would match the lower river needs.

Article 56 requires the project to be operated in accordance with the following minimum flows:

- August 1 to April 15—Continuous at 3,200 cubic feet per second ("cfs").
- April 16 to April 30—Increased from 3,200 cfs to 5,000 cfs at 120 cfs per day.
- May 1 to May 15—Increased from 5,000 cfs to 12,700 cfs at 510 cfs per day.
- May 16 to June 30—Continuous flows at 12,700 cfs.
- **July 1 to July 15—Reduced from 12,700 to 6,400 cfs at 420 cfs per day.**[19] 3.2.1 Drought Management Plan Goals

The Drought Management Plan, at the least, will accomplish the following goals:

- Provide for the development of an annual process through which water conditions will be evaluated, an annual plan will be prepared and updated at monthly intervals.
- Provide for a process by which, in low water years, forecasts will be converted into a protocol for operation of the Kerr project during critical periods.
- Provide for input by all interested stakeholders and consideration of the information submitted.
- Provide for communication of water shortage information to all interests.
- Provide for a drought response plan that is fair to all interests at stake.

KEEP IN MIND THE HH Salmon draft generally starts in July, just after reservoir refill, flows in the 8 to 12 kcfs range possible out of the reservoir to get to draft limits. More likely to be in the lower range if the 10 limit and longer draft period adopted, higher range if not.

Var-q - key point, only in average or dryer years. Alternative flood control
www.usbr.gov/pn/programs/VARQ/

ADD links to river flows in flathead and clarkfork rivers

http://www.nwd-wc.usace.army.mil/nws/hh/basins/cgi-bin/flathead.pl

SUMMARY

Subbasin Plan to be on the table in March for science and Public review
Should be adopted by end of year by council

Next round of Planning for other basins – at lease 3 years out

Mainstem amendments control river operations
Power struggle to get them implemented

BIOP controls river operations, under court scrutiny,